

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

In re Application of:

Melik Isbara

Serial No.: 08/925,868

Filed: September 9, 1997

For: **METHOD AND APPARATUS
FOR INTERFACING MIXED VOLTAGE
SIGNALS**

Examiner: Kenneth B. Wells

Art Group: 2816

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REPLY BRIEF

Box: Board of Patent Appeals and Interferences
Assistant Commissioner for Patents
Washington, D.C. 20231

Dear Sir:

In response to the Examiner's answer mailed August 16, 2001 in connection with the above-identified application, Appellant submits the following reply.

Under the section entitled "Grounds of Rejection" in the Examiner's answer, it is contended that the replacement of a discrete resistor with a continuously-on biased FET is notoriously well known in the art. In addition, it is stated that there is an obvious motivation to make such a replacement to save chip real estate, since

discrete resistors take up more space than integrated FETs. Appellant respectfully disagrees with these contentions for the following reasons.

Firstly, although a continuously-on biased FET may provide a relatively predictable resistance, this does not teach or suggest the Examiner's contention that in applications in which a discrete resistor is used, a continuously-on biased FET would work just as well. In support of this contention, the Examiner's answer, on page 5, cites several references which allegedly show the equivalence of a discrete resistor and a continuously biased FET. Appellant now addresses each of these in turn.

U. S. Patent No. 5,130,571 to Carroll ("Carroll") seeks to optimize speed and charge injection parameters of a switched capacitor circuit. A typical switch capacitor circuit 10 is shown in Fig. 1 of Carroll, where the circuit includes a n-channel transistor M1 connected between an input V_{in} and the output V_{out} . Carroll then states:

Since transistor M1 may be thought of as an equivalent resistor $R_{eq} = R(M1)$ for $V_{in} < V_{control} - V_{tn}$, the switched capacitor circuit 10 shown in Fig. 1 may be illustrated as an RC circuit 10' during a sample time t_s , as shown in Fig. 2.

Carroll, column 1 lines 20-24. Contrary to the Examiner's contention, this does not teach or suggest that a discrete resistor can be readily replaced with a continuously-on biased FET. Rather, the emphasized portion of Carroll only suggests that in a switched capacitor circuit where a transistor is used in a switching sense, the behavior of the transistor during one portion of the switching cycle (as

shown in Fig. 3 of Carroll) can be represented as an equivalent resistance. It is improper to generalize from this narrow teaching that one of ordinary skill in the art would be readily motivated to replace a resistor in a circuit design with a continuously biased FET.

U. S. Patent No. 4,970,478 to Townley ("Townley") is directed to a matched microwave variable attenuator. This variable attenuator is a sequence of LRC components in which a shunt resistance is obtained by using a biased FET, because the biased FETs exhibit resistive changes with properly applied DC voltage and are thus useful as variable resistors. Townley, column 1 lines 15-20. This variable resistance is particularly useful in microwave applications, because of the desire to provide an attenuator whose impedance matches that of the transmission line. Townley, column 1 lines 21-24. It is important to note here that, now referring to Fig. 6 of Townley, the transistor 26 is used to present a variable shunt resistance which, in all circumstances, attenuates an input microwave signal across its source drain terminals. This configuration of the variable resistance coupled in parallel with a capacitor is similar to the combination $R_2 - C_2$ in Nelson, and not the combination of $R_1 - C_1$. Thus, although Townley might arguably suggest that, for microwave applications, a parallel combination of $R_2 - C_2$ as in Nelson be modified to form the combination shown in Fig. 6 of Townley, that would not teach or suggest that the same modification would work or even be desirable for the series connection of the combination $R_1 - C_1$ in Nelson. This distinction is important, because Appellant's claims are directed to the configuration of a transistor such that

the input terminal is coupled to receive the binary signals and the output terminal is coupled to deliver the binary signals, i.e. a series type of connection. This series vs. shunt distinction is also apparent when it is recognized that in Townley, both the input and output signals of the attenuator are measured with respect to the same electrical node which is shorted to the lower terminal of the transistor 26 (see Fig. 6 of Townley) - a shunt-type connection. Accordingly, Townley does not teach or suggest that a discrete resistor in a series configuration be replaced by a biased FET.

U. S. Patent No. 5,604,364 to Ohmi et al. ("Ohmi") is directed to a photoelectric converter. Ohmi discusses an analysis of circuit operation by modeling a transistor 40-40" as an equivalent resistance R_m . Ohmi, Fig. 9 and column 4 lines 66-67 and column 21 lines 62 to column 22 line 1. Again, this does not suggest the contention made in the Examiner's answer of replacing an actual discrete resistor with a transistor in an attenuator circuit.

The above discussion of Carroll, Townley, and Ohmi makes it clear that replacing a discrete resistor with a continuously-on biased FET is not notoriously well known in the art for all circuit applications. Although it is true, such as described in Townley, that in some cases, namely a number of shunt resistances in a LRC microwave attenuator, the discrete resistor could be replaced by a variable resistance transistor to make it easier to match the impedance of the attenuator with that of a transmission line, this does not provide the general teaching that in all instances, a discrete, series connected resistor may be readily replaced by a continuously biased FET. It would be an improper use of hindsight to argue, as has

been done in the Examiner's answer, that it is well known in the art to replace such a connected discrete resistor with a continuously-on biased FET.

A second point of issue with the Examiner's answer is that even if one of ordinary skill in the art would know that each instance of a discrete resistor could be replaced by a continuously biased FET, there is no obvious motivation to make such a replacement to modify the attenuator of Nelson.

According to the Examiner's answer on page 4, motivation to make such a replacement would be to save chip real estate, since discrete resistors take up more space than integrated FETs acting as resistance elements. According to the Examiner's answer, on page 4, use of a series resistor between a gate bias voltage and the gate of the FET, for the purpose of controlling the on level of the FET and thereby controlling the resistance value of the FET, is also known in the art. However, this argument fails because the motivation to save chip real estate is not met by replacing a single resistor with a combination of a FET and gate bias resistor. If an additional resistance is also needed to make the transistor operate as an equivalent resistance, then where is the savings in chip real estate? Furthermore, there is the additional requirement of providing access to a suitable voltage source to bias the gate of the transistor. Thus, it is not at all clear that one of ordinary skill in the art would be motivated to replace a single, discrete resistor as in Nelson with a FET, a gate resistor, and additional metal traces to access a suitable voltage source, in the hope of making more efficient use of chip real estate.

In view of the foregoing, Appellant respectfully requests that the Board
overturn the obviousness rejection of the claims.

Respectfully submitted,

BLAKELY SOKOLOFF TAYLOR & ZAFMAN LLP



Dated: October 16, 2001

Farzad E. Amini, Reg. No. 42,261

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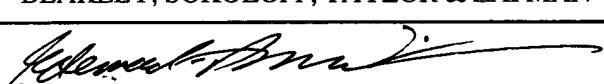
		Application Number	08/925,868
		Filing Date	September 9, 1997
		First Named Inventor	Melik Isbara
		Group Art Unit	2816
		Examiner Name	Kenneth B. Wells
Total Number of Pages in This Submission	10	Attorney Docket Number	42390P4537

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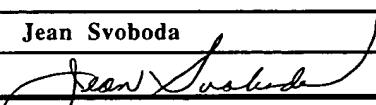
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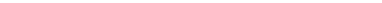
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ADDITIONAL FEE</p> <table border="1"> <thead> <tr> <th>Large Entity</th> <th>Small Entity</th> <th>Fee Description</th> </tr> <tr> <th>Fee Code</th> <th>Fee Code</th> <th>Fee Description</th> </tr> </thead> <tbody> <tr> <td>105</td> <td>130 205</td> <td>65 Surcharge - late filing fee or oath</td> </tr> <tr> <td>127</td> <td>50 227</td> <td>25 Surcharge - late provisional filing fee or cover sheet.</td> </tr> <tr> <td>139</td> <td>130 139</td> <td>130 Non-English specification</td> </tr> <tr> <td>147</td> <td>2,520 147</td> <td>2,520 For filing a request for ex parte reexamination</td> </tr> <tr> <td>112</td> <td>920 112</td> <td>920 Requesting publication of SIR prior to Examiner action</td> </tr> <tr> <td>113</td> <td>1,840 113</td> <td>1,840 Requesting publication of SIR after Examiner action</td> </tr> <tr> <td>115</td> <td>110 215</td> <td>55 Extension for response within first month</td> </tr> <tr> <td>116</td> <td>400 216</td> <td>200 Extension for response within second month</td> </tr> <tr> <td>117</td> <td>920 217</td> <td>460 Extension for response within third month</td> </tr> <tr> <td>118</td> <td>1,440 218</td> <td>720 Extension for response within fourth month</td> </tr> <tr> <td>128</td> <td>1,960 228</td> <td>980 Extension for response within fifth month</td> </tr> <tr> <td>119</td> <td>320 219</td> <td>160 Notice of Appeal</td> </tr> <tr> <td>120</td> <td>320 220</td> <td>160 Filing a brief in support of an appeal</td> </tr> <tr> <td>121</td> <td>280 221</td> <td>140 Request for oral hearing</td> </tr> <tr> <td>138</td> <td>1,510 138</td> <td>1,510 Petition to institute a public use proceeding</td> </tr> <tr> <td>140</td> <td>110 240</td> <td>55 Petition to revive - unavoidably</td> </tr> <tr> <td>141</td> <td>1,280 241</td> <td>640 Petition to revive - unintentionally</td> </tr> <tr> <td>142</td> <td>1,280 242</td> <td>640 Utility issue fee (or reissue)</td> </tr> <tr> <td>143</td> <td>460 243</td> <td>230 Design issue fee</td> </tr> <tr> <td>144</td> <td>620 244</td> <td>310 Plant issue fee</td> </tr> <tr> <td>122</td> <td>130 122</td> <td>130 Petitions to the Commissioner</td> </tr> <tr> <td>123</td> <td>50 123</td> <td>50 Petitions related to provisional applications</td> </tr> <tr> <td>126</td> <td>180 126</td> <td>180 Submission of Information Disclosure Stmt</td> </tr> <tr> <td>581</td> <td>40 581</td> <td>40 Recording each patent assignment per property (times number of properties)</td> </tr> <tr> <td>146</td> <td>740 246</td> <td>370 Filing a submission after final rejection (37 CFR 1.129(a))</td> </tr> <tr> <td>149</td> <td>740 249</td> <td>370 For each additional invention to be examined (37 CFR 1.129(b))</td> </tr> <tr> <td>179</td> <td>740 279</td> <td>370 Request for Continued Examination (RCE)</td> </tr> <tr> <td>169</td> <td>900 169</td> <td>900 Request for expedited examination of a design application</td> </tr> <tr> <td colspan="5">Other fee (specify) _____</td> </tr> <tr> <td colspan="5">SUBTOTAL (2) (\$)</td> <td colspan="5">SUBTOTAL (3) (\$)</td> </tr> <tr> <td colspan="10"> <small>* or number previously paid, if greater; 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